

Serial No. 10/538,152
Atty. Doc. No. 2002P18325WOUS

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REMARKS

Claims 13, 17, 19, 23, 26, 29, 31, 33, and 34 are pending. Claims 13, 17, 19, 23, 26, 29, 31, 33, and 34 are rejected under 35 USC 103(a) as being unpatentable over Burgess (US 5,805,896) in view of Sakurai et al. (US 6,334,076) and further in view of Elmqvist ("A Uniform Architecture for Distributed Automation", Advances in Instrumentation and Control, Instrument Society of America, Research Triangle Park, NC US, Vol. 46, Part 2, 1991, Pages 1599-1608).

The independent claims 13, 26, and 33 are amended herein. Claims 13, 17, 19, 23, 26, 29, 31, 33, and 34 are presented for examination. No new matter is added.

Response to 35 USC 103(a) rejections

Applicant's paragraph and line numbers herein refer to Applicant's substitute specification. Claim 13 received a minor structural revision in addition to the clarification described below.

Burgess does not teach providing a predecessor/successor specification in event objects prior to the visual design stage. The visual design stage generates the connection table of FIG 6. This requires expert knowledge during the visual design stage. For example, a visual designer could accidentally reverse the places of the F-to-C converter and the C-to-F converter, thus reversing the Fahrenheit and Centigrade readings on the scroll bars. The connection class CObject does not specify the connections to be made by the interactive graphical programmer, but instead tracks them (col. 4, lines 36-37).

In contrast, Applicant's invention provides control-relevant information in the descriptions that specifies directed relationships between components. This is exemplified in FIG 2, which shows control-relevant information that not only designates ports as input or output, as in Burgess, but also designates them as a predecessor P or successor S (par. 22). This prevents the above mistake, and allows the prior input of control information by experts to limit the visual design to a particular order, such as that of the claimed material flow. The claim limitation "directed relationships" is clarified herein to explicitly include predecessor/successor relationships.

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Applicant provides predecessor/successor information in the component descriptions prior to the generation of code. A purpose and achievement of the invention is continuity of system design information in the design process (par. 4 and par 9). In Applicant's paragraph 10: "In the system according to the invention data continuity is achieved in that control-relevant information is already contained in a description." Also in par. 10: "In the system according to the invention information on the predecessor-successor relationships of the components in the plant is allocated to these ports."

To clarify this feature in the independent claims, the following has been inserted: "information comprising predecessor/successor relationships among the components is included in the description". This is not new matter, since the claims already recite "directed relationships between the components". However, it clarifies this distinction between the present invention and Burgess. This deficiency in Burgess is not satisfied by Sakurai or Elmqvist.

Examiner concedes in the office action on page 9, in the last 3 lines, that Burgess and Sakurai do not explicitly disclose that the control information described in the drawing is based on the material flow in the manufacturing and/or processing plant. Examiner holds that Elmqvist supplies this feature, because it is inherent that the physical objects of the plant form the path for the material or fluid flow as shown in the example of the tank system (figures 1-5). However, as in Burgess, this tank system layout only exists after the visual designer has selected the graphic components and placed them in this order. These graphical components do not have predecessor/successor descriptions stored in them to require an order and prevent mistakes. Instead, the design module definitions are purely hierarchical (FIG 2). The first line under VISUALIZATION on page 1605 states: "The complete picture, as seen in a window, is a hierarchical picture according to the module hierarchy." The two tanks of FIG 1 are just instantiations of the same "tank" object. Thus their order in FIG 1 could be reversed - the same kind of mistake discussed for Burger above. It so happens that this reversal would not make a difference in FIG 1 of Elmqvist, but only because FIG 1 is too simple an example to illustrate an ordered relationship. The examples of Elmqvist and Burgess are both highly simplified, but at least the example of Burgess can be used to show how order is important, which is the case in a manufacturing or processing plant.

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Conclusion

The proposed combination of Burger, Sakurai, and Elmqvist does not teach or inherently suggest claimed features of the present invention, as argued above. These features provide major benefits in safety and continuity of plant automation design over the prior art. Therefore, Applicant respectfully requests withdrawal of the 35 USC 103 rejections, and allowance of the present application.

The commissioner is hereby authorized to charge any appropriate fees due in connection with this paper, including the fees specified in 37 C.F.R. §§ 1.16 (c), 1.17(a)(1) and 1.20(d), or credit any overpayments to Deposit Account No. 19-2179.

Respectfully submitted,

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